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electrochemiluminescent same microparticle	6

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<u>L2</u>	5679519.pn.	1	<u>L2</u>
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 1. Document ID: US 6319670 B1

L4: Entry 1 of 6

File: USPT

Nov 20, 2001

US-PAT-NO: 6319670

DOCUMENT-IDENTIFIER: US 6319670 B1

TITLE: Methods and apparatus for improved luminescence assays using microparticles

DATE-ISSUED: November 20, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Sigal; George B.	Rockville	MD		
Wohlstadter; Jacob N.	Rockville	MD		
Gudibande; Satyanarayana	Gaithersburg	MD		
Martin; Mark T.	Rockville	MD		
Wilbur; James L.	Germantown	MD		

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
Meso Scale Technology LLP	Gaithersburg	MD			02

APPL-NO: 8/ 998137

DATE FILED: December 23, 1997

PARENT-CASE:

CROSS-REFERENCE TO RELATED APPLICATION This application is a continuation-in-part of U.S. application Ser. No. 08/954,355 filed Oct. 20, 1997, incorporated herein by reference, which is a continuation of U.S. application Ser. No. 08/437,348, filed May 9, 1995 (now U.S. No. 5,679,519), incorporated herein by reference.

INT-CL: [7] C12 Q 1/68

US-CL-ISSUED: 435/6; 436/534

US-CL-CURRENT: 435/6; 436/534

FIELD-OF-SEARCH: 435/6, 436/534, 436/548, 436/808, 536/26.6, 536/24.3, 536/24.32, 536/24.33

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
<u>5252459</u>	October 1993	Tarcha et al.	435/6
<u>5679519</u>	October 1997	Oprandy	435/6

ART-UNIT: 166

PRIMARY-EXAMINER: Houtteman; Scott W.

ATTY-AGENT-FIRM: Kramer Levin Naftalis & Frankel LLP Evans, Esq.; Barry

ABSTRACT:

The present invention relates to methods, reagents and compositions, for conducting electrochemiluminescence binding assays which improve one or more characteristics of the assay or the instruments used to conduct the assay. The method is achieved using microparticles that include electrically conductive material. The electrically conductive material has one or more copies of an assay ligand immobilized on its outer surface and a plurality of electrochemiluminescent moieties immobilized on its outer surface. The assay ligand may be linked to the electrochemiluminescent moiety.

44 Claims, 5 Drawing figures

[Full](#) | [Title](#) | [Citation](#) | [Front](#) | [Review](#) | [Classification](#) | [Date](#) | [Reference](#) | [Sequences](#) | [Attachments](#) | [Claims](#) | [Kwic](#) | [Draw Desc](#) | [Image](#)

2. Document ID: US 6187270 B1

L4: Entry 2 of 6

File: USPT

Feb 13, 2001

US-PAT-NO: 6187270

DOCUMENT-IDENTIFIER: US 6187270 B1

TITLE: Device and method for the separation of magnetic microparticles

DATE-ISSUED: February 13, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Schmitt; Urban	Oberhausen			DEX
Maurer; Eberhard	Weilheim			DEX
Pappert; Gunter	Starnberg			DEX

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
Roche Diagnostics GmbH	Mannheim			DEX	03

APPL-NO: 8/ 499078

DATE FILED: July 6, 1995

FOREIGN-APPL-PRIORITY-DATA:

COUNTRY	APPL-NO	APPL-DATE
DE	44 23 878	July 7, 1994

INT-CL: [7] G01 N 35/10, G01 N 33/543, B01 L 3/02

US-CL-ISSUED: 422/101, 422/63, 422/100, 436/43, 436/54, 436/174, 436/177, 436/180, 436/807, 210/222, 210/695

US-CL-CURRENT: 422/101, 210/222, 210/695, 422/100, 422/63, 436/174, 436/177, 436/180, 436/43, 436/54, 436/807

FIELD-OF-SEARCH: 422/63-67, 422/100, 422/101, 436/43, 436/49, 436/47, 436/54, 436/174, 436/177, 436/180, 436/807, 436/809, 436/810, 210/695, 210/222, 210/223

PRIOR-ART-DISCLOSED:

U. S. PATENT DOCUMENTS

PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
<u>3985649</u>	October 1976	Eddelman	259/1R
<u>4292920</u>	October 1981	Smith et al.	
<u>4526046</u>	July 1985	Oberliet al.	73/864.16
<u>5013529</u>	May 1991	Itoh	422/100
<u>5160378</u>	November 1992	Tuunanen et al.	134/25.1
<u>5171537</u>	December 1992	Wainwright et al.	422/100
<u>5183638</u>	February 1993	Wakatake	422/64
<u>5200084</u>	April 1993	Liberti et al.	210/695
<u>5200151</u>	April 1993	Long	422/100
<u>5647994</u>	July 1997	Tuunanen et al.	210/695
<u>5702950</u>	December 1997	Tajima	439/49

FOREIGN PATENT DOCUMENTS

FOREIGN-PAT-NO	PUBN-DATE	COUNTRY	US-CL
0 272 915 A2	June 1988	EPX	
0 339 980 A1	November 1989	EPX	
0 687 501 A2	December 1995	EPX	
60-159651	August 1985	JPX	
1-321363	December 1989	JPX	
4-194752	July 1992	JPX	
WO 93/13400	July 1993	WOX	
WO 95/00247	January 1995	WOX	

ART-UNIT: 173

PRIMARY-EXAMINER: Le; Long V.

ATTY-AGENT-FIRM: Arent Fox Kintner Plotkin & Kahn PLLC

ABSTRACT:

The invention addresses a device for separating magnetic microparticles in a liquid with the aid of a magnetic field. During the separation procedure, the liquid containing the microparticles is located in the tip of the pipette. Moreover, the invention also addresses a method for separating microparticles, and a method for washing microparticles.

13 Claims, 8 Drawing figures

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	KMC	Drawn Desc	Image
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 3. Document ID: US 6133043 A

L4: Entry 3 of 6

File: USPT

Oct 17, 2000

US-PAT-NO: 6133043

DOCUMENT-IDENTIFIER: US 6133043 A

TITLE: Magnetic particle based electrochemiluminescent detection apparatus and method

DATE-ISSUED: October 17, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Talley; David B.	Olney	MD		
Leland; Jonathan K.	Silver Spring	MD		

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
IGEN International, Inc.	Gaithersburg	MD			02

APPL-NO: 9/ 066704

DATE FILED: April 27, 1998

PARENT-CASE:

This application is a continuation of application Ser. No. 08/339,237, filed Nov. 10, 1994, now U.S. Pat. No. 5,744,367, issued Apr. 28, 1998, which is incorporated herein by reference.

INT-CL: [7] G01 N 21/76

US-CL-ISSUED: 436/172, 422/52, 250/361C, 436/526

US-CL-CURRENT: 436/172; 250/361C, 422/52, 436/526

FIELD-OF-SEARCH: 422/52, 436/526, 436/172, 250/361C

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
4554088	November 1985	Whitehead et al.	252/62.54
4628037	December 1986	Chagnon et al.	436/526
4695392	September 1987	Whitehead et al.	252/62.54
4695393	September 1987	Whitehead et al.	252/62.54
4698302	October 1987	Whitehead et al.	435/94
5744367	April 1998	Talley et al.	436/172

FOREIGN PATENT DOCUMENTS

FOREIGN-PAT-NO	PUBN-DATE	COUNTRY	US-CL
0180384	May 1986	EPX	
86/02734	May 1986	WOX	
89/04302	May 1989	WOX	
90/05301	May 1990	WOX	
WO 92/14139	August 1992	WOX	
92/14138	August 1992	WOX	

OTHER PUBLICATIONS

Kenten et al., Clinical Chemistry, vol. 38, No. 6, Jun. 1992 (pp. 873-879).
 Blackburn et al., Clinical Chemistry, "Electrochemiluminescence Detection for Immunoassays", vol. 37, No. 8, 1991. No month available.
 Massay, Richard, Biomedical Products, "Electrochemiluminescence: A Novel Detection System . . . ", Oct. 1992.
 Kenten, J.H. et al., 37, Clin. Chem., p. 1626-1632 (1991) No month available.
 Kenten, J.H. et al. 6, Mol. Cell. Probes, p. 495-503 (1992) No month available.
 DiCesare, J. et al., 15, Biotechniques, p. 152 (Jul., 1993).

ART-UNIT: 173

PRIMARY-EXAMINER: Warden; Jill
ASSISTANT-EXAMINER: Starsiak, Jr.; John S.
ATTY-AGENT-FIRM: Whitman Breed Abbott & Morgan LLP

ABSTRACT:

A method and apparatus for measuring electrochemiluminescence from a sample composition are described wherein magnetically responsive electrochemiluminescent active species are captured on the electrode with the aid of a capture magnet having a configuration such that the magnetic flux lines (or the magnetic field gradient) of at least one magnetic field source therein are compressed and/or dispersed. This capture magnet improves the distribution of the magnetically responsive electrochemiluminescent active species on the electrode surface and reduces interference with the photomultiplier tube, thereby enhancing the ECL signal and improving sensitivity. The improved capture and distribution also allows for shorter assay times.

15 Claims, 12 Drawing figures

[Full](#) [Title](#) [Citation](#) [Front](#) [Review](#) [Classification](#) [Date](#) [Reference](#) [Sequences](#) [Attachments](#)

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4. Document ID: US 6132955 A

L4: Entry 4 of 6

File: USPT

Oct 17, 2000

US-PAT-NO: 6132955

DOCUMENT-IDENTIFIER: US 6132955 A

TITLE: Method for derivitizing electrodes and assay methods using such derivitized electrodes

DATE-ISSUED: October 17, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Talley; David	Olney	MD		
Leland; Jonathan K.	Silver Spring	MD		
Blackburn; Gary F.	Gaithersburg	MD		

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
IGEN International, Inc.	Gaithersburg	MD			02

APPL-NO: 8/ 922761

DATE FILED: September 3, 1997

PARENT-CASE:

This application is a continuation of application Ser. No. 08/443,497, filed May 18, 1995, now abandoned.

INT-CL: [7] C12 Q 1/00

US-CL-ISSUED: 435/4; 435/5, 435/6, 435/7.1, 435/7.7, 435/817, 436/526, 436/518, 204/400, 204/403

US-CL-CURRENT: 435/4; 204/400, 205/777.5, 205/787, 205/794.5, 435/5, 435/6, 435/7.1, 435/7.7, 435/817, 436/518, 436/526

FIELD-OF-SEARCH: 204/400, 204/403, 435/4-6, 435/7.1, 435/7.7, 435/817, 436/526, 436/578

PRIOR-ART-DISCLOSED:

U. S. PATENT DOCUMENTS

PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
<u>4554088</u>	November 1985	Whitehead et al.	
<u>4628037</u>	December 1986	Chagnon et al.	436/526
<u>4655885</u>	April 1987	Hill et al.	204/72
<u>4695392</u>	September 1987	Whitehead et al.	
<u>4695393</u>	September 1987	Whitehead et al.	
<u>4698302</u>	October 1987	Whitehead et al.	435/94
<u>4882057</u>	November 1989	Broderick	128/631
<u>4945045</u>	July 1990	Forrest et al.	435/25

FOREIGN PATENT DOCUMENTS

FOREIGN-PAT-NO	PUBN-DATE	COUNTRY	US-CL
0180384	May 1986	EPX	
2105750	March 1983	GBX	
86/02734	May 1986	WOX	
87/00987	February 1987	WOX	
88/03947	June 1988	WOX	
89/04919	June 1989	WOX	
05301	May 1990	WOX	
00982	February 1992	WOX	
92/14138	August 1992	WOX	

OTHER PUBLICATIONS

Blackburn et al. "Electrochemiluminescence Detection for Development of Immunoassays and DNA Probe Assays for Clinical Diagnostics," 37, Clinical Chemistry 1534-1539 (1991).

ART-UNIT: 162

PRIMARY-EXAMINER: Huff; Sheela

ATTY-AGENT-FIRM: Whitman Breed Abbott & Morgan LLP

ABSTRACT:

An electrode can be derivitized by contacting it with a derivitizing solution to make it more sensitive to a desired analyte signal as opposed to interfering signals in an assay. Particularly, in an electrochemiluminescence (ECL) immunoassay the working electrode can be derivitized to be more sensitive to desired analyte signals, as opposed to interfering non-bound conjugate or serum matrix signals.

22 Claims, 11 Drawing figures

[Full](#) | [Title](#) | [Citation](#) | [Front](#) | [Review](#) | [Classification](#) | [Date](#) | [Reference](#) | [Sequences](#) | [Attachments](#)
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 5. Document ID: US 5989463 A

L4: Entry 5 of 6

File: USPT

Nov 23, 1999

US-PAT-NO: 5989463

DOCUMENT-IDENTIFIER: US 5989463 A

TITLE: Methods for fabricating polymer-based controlled release devices

DATE-ISSUED: November 23, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Tracy; Mark A.	Arlington	MA		
Herberger; John D.	Moore Park	CA		
Burke; Paul A.	Oxnard	CA		
Herbert; Paul F.	Wayland	MA		

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE	CODE
Alkermes Controlled Therapeutics, Inc.	Cambridge	MA				02

APPL-NO: 8/ 935452

DATE FILED: September 24, 1997

INT-CL: [6] B01 J 13/02, B01 J 13/04, A61 K 9/22

US-CL-ISSUED: 264/4.1; 604/890.1, 424/484, 424/486, 424/489, 514/2, 514/21

US-CL-CURRENT: 264/4.1; 424/484, 424/486, 424/489, 514/2, 514/21, 604/890.1

FIELD-OF-SEARCH: 264/4.1, 604/890.1, 424/484, 424/486, 424/489, 514/2, 514/21

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
<u>3691090</u>	September 1972	Kitajima et al.	252/316
<u>3737337</u>	June 1973	Schnoring et al.	117/100
<u>3887699</u>	June 1975	Yolles	424/19
<u>3891570</u>	June 1975	Fukushima et al.	252/316
<u>4166800</u>	September 1979	Fong	252/316
<u>4389330</u>	June 1983	Tice et al.	427/213.36
<u>4530840</u>	July 1985	Tice et al.	514/179
<u>4542025</u>	September 1985	Tice et al.	424/78
<u>4675189</u>	June 1987	Kent et al.	424/490
<u>4818542</u>	April 1989	DeLuca et al.	424/491
<u>4835139</u>	May 1989	Tice et al.	514/15
<u>4849228</u>	July 1989	Yamamoto et al.	424/457
<u>4938763</u>	July 1990	Dunn et al.	604/891.1
<u>5019400</u>	May 1991	Gombotz et al.	424/497
<u>5192741</u>	March 1993	Orsolini et al.	514/4
<u>5232707</u>	August 1993	Lokensgard	424/490
<u>5401502</u>	March 1995	Wunderlich et al.	424/195.1
<u>5478564</u>	December 1995	Wantier et al.	424/426
<u>5540937</u>	July 1996	Billot et al.	424/489
<u>5556642</u>	September 1996	Kobayashi et al.	424/502
<u>5585460</u>	December 1996	Yamada et al.	528/491
<u>5594091</u>	January 1997	Igari et al.	528/271
<u>5609886</u>	March 1997	Wantier et al.	424/497
<u>5650173</u>	July 1997	Ramstack et al.	424/489
<u>5654010</u>	August 1997	Johnson et al.	424/502
<u>5656297</u>	August 1997	Bernstein et al.	424/484
<u>5667808</u>	September 1997	Johnson et al.	424/501
<u>5674534</u>	October 1997	Zale et al.	424/501
<u>5711968</u>	January 1998	Tracy et al.	424/487
<u>5716644</u>	February 1998	Zale et al.	424/497

FOREIGN PATENT DOCUMENTS

FOREIGN-PAT-NO	PUBN-DATE	COUNTRY	US-CL
0 190 833 A2	August 1986	EPX	
0 537 559 A1	April 1993	EPX	
0 556 917 A1	August 1993	EPX	
0 586 838 A1	March 1994	EPX	
WO 89/03678	May 1989	WOX	
WO 89/05138	June 1989	WOX	
WO 90/13780	November 1990	WOX	
WO 90/13285	November 1990	WOX	
WO 93/07861	April 1993	WOX	
WO 95 29664 A1	November 1995	WOX	
WO 96 12478 A1	May 1996	WOX	
WO 96 19201 A1	June 1996	WOX	
WO 97 07788 A2	March 1997	WOX	
WO 97 42940 A1	November 1997	WOX	

OTHER PUBLICATIONS

Sato, T. et al., "Porous Biodegradable Microspheres for Controlled Drug Delivery. I.

Assessment of Processing Conditions and Solvent Removal Techniques," *Pharmaceutical Research*, 5(1):21-29 (Jan. 1988).

ART-UNIT: 171

PRIMARY-EXAMINER: Nutter, Nathan M.

ATTY-AGENT-FIRM: Hamilton, Brook, Smith & Reynolds, P.C.

ABSTRACT:

The present invention relates to a polymer-based sustained release device, and methods of forming and using the device for the sustained release of an active agent. The improved method of the invention for forming a polymer-bases sustained release device comprises forming a polymer/active agent solution by mixing a polymer, a continuous phase, and an active agent. The continuous phase can comprise one or more polymer solvents, a polymer solvent/polymer non-solvent mixture, or a polymer solvent/active agent non-solvent mixture. When the continuous phase comprises a polymer solvent/active agent non-solvent, the active agent can also be present as a microparticulate rather than in solution. The continuous phase is then removed from the polymer/active agent solution, thereby forming a solid polymer/active agent matrix.

15 Claims, 3 Drawing figures

[Full](#) [Title](#) [Citation](#) [Front](#) [Review](#) [Classification](#) [Date](#) [Reference](#) [Sequences](#) [Attachments](#) [KMIC](#) [Drawn Desc](#) [Image](#)

6. Document ID: US 5744367 A

L4: Entry 6 of 6

File: USPT

Apr 28, 1998

US-PAT-NO: 5744367

DOCUMENT-IDENTIFIER: US 5744367 A

TITLE: Magnetic particle based electrochemiluminescent detection apparatus and method

DATE-ISSUED: April 28, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Talley; David B.	Olney	MD		
Leland; Jonathan K.	Silver Spring	MD		

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
IGEN International, Inc.	Gaithersburg	MD			02

APPL-NO: 8/ 339237

DATE FILED: November 10, 1994

INT-CL: [6] G01 N 21/76

US-CL-ISSUED: 436/172; 250/361C, 422/52

US-CL-CURRENT: 436/172; 250/361C, 422/52

FIELD-OF-SEARCH: 250/361C, 422/52, 436/172

PRIOR-ART-DISCLOSED:

U. S. PATENT DOCUMENTS

PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
<u>4554088</u>	November 1985	Whitehead et al.	252/62.54
<u>4628037</u>	December 1986	Chagnon et al.	436/526
<u>4695392</u>	September 1987	Whitehead et al.	252/62.54
<u>4695393</u>	September 1987	Whitehead et al.	252/62.54
<u>4698302</u>	October 1987	Whitehead et al.	435/94
<u>5466417</u>	November 1995	Ghaed et al.	422/52

FOREIGN PATENT DOCUMENTS

FOREIGN-PAT-NO	PUBN-DATE	COUNTRY	US-CL
0 180 384	May 1986	EPX	
19501916	July 1995	DEX	
86/02734	May 1986	WOX	
89/04302	May 1989	WOX	
90/05301	May 1990	WOX	
9214139	August 1992	WOX	
9214138	August 1992	WOX	
92/14138	August 1992	WOX	
9301308	January 1993	WOX	

OTHER PUBLICATIONS

Kenten et al., Clinical Chemistry, vol. 38, No. 6, Jun. 1992 pp. 873-879.
 Blackburn et al., Clinical Chemistry, Electrochemiluminescence Detection for Immunoassays, vol. 37, No. 8, Sep. 1991, pp. 1534-1539.
 Massay, Richard, Biomedical Products, "Electrochemiluminescence: A novel detection system . . .", Oct., 1992.
 Kenten, J.H. et al., 37, Clin. Chem., pp. 1626-1632 (Jun. 1991).
 Kenten, J.H. et al., 6, Mol. Cell. Probes, pp. 495-503 (1992).
 DiCesare, J. et al., 15, Biotechniques, p. 152 (Jul. 1993).

ART-UNIT: 112

PRIMARY-EXAMINER: Gorgos; Kathryn L.

ASSISTANT-EXAMINER: Starsiak, Jr.; John S.

ATTY-AGENT-FIRM: Whitman Breed Abbott & Morgan LLP Evans, Esq.; Barry

ABSTRACT:

A method and apparatus for measuring electrochemiluminescence from a sample composition are described wherein magnetically responsive electrochemiluminescent active species are captured on the electrode with the aid of a capture magnet having a configuration such that the magnetic flux lines (or the magnetic field gradient) of at least one magnetic field source therein are compressed and/or dispersed. This capture magnet improves the distribution of the magnetically responsive electrochemiluminescent active species on the electrode surface and reduces interference with the photomultiplier tube, thereby enhancing the ECL signal and improving sensitivity. The improved capture and distribution also allows for shorter assay times.

23 Claims, 12 Drawing figures

Terms	Documents
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